

REMARKS

Claim 2 was earlier canceled. Claim 3 is herein canceled. Claims 5-7 stand withdrawn. Claims 9-10 have been added. Claims 1 and 4-10 remaining pending. Reconsideration and reexamination, of the application, as amended, are requested.

The Examiner rejected claims 1 and 3-8 under 35 USC §103(a) as being obvious on consideration of Yu.

As admitted by the Examiner, the conditions for an ashing process (using oxygen gas plasma and under an atmospheric pressure from 0.01 Torr to 30.0 Torr) disclosed in the Yu patent. The Yu patent discloses an ashing process in column 8, lines 13-37, however the pressure for the ashing process is not disclosed at all.

The method of claim 1 prevents Si-H bonding, etc., from being cut and thereby prevents the dielectric constant from becoming higher. Achieving this can be attained by the conditions for an ashing process as mentioned above, and the effect of such conditions is supported by the embodiments, the comparative embodiment, and FIGS. 3-6.

On the other hand, the Yu patent only discloses a damascene method using a low K material, and fails to disclose or suggest steps of claim 1, e.g., the conditions for an ashing process.

Thus, claim 1 and the claims which depend from it are non-obvious over Yu and are patentable.

The present invention is further distinguished from Yu by incorporating claim 3 into claim 1 to form claim 9.

The low K material disclosed in the Yu patent (column 4, line 53 - column 5, line 12) has high content of carbon, which is apparent from the schematic of FIG. 2. In contrast, according to claim 9, the carbon content is low, specifically in the range of 5% to 25 % by atomic weight.

Neither an etching step nor an ashing process performing step under the conditions specified by claim 9 is disclosed by Yu. Furthermore, there is no motivation in the prior art to perform the claimed method under the specified conditions because the effects as discussed with claim 1 above have not been appreciated by the prior art. Hence, claim 9 and claim 10 which depends from it are non-obvious over Yu and are patentable.

In view of the above, it is submitted that the application is in condition for allowance. Reconsideration and reexamination are requested. Allowance of claims 1 and 4-10 at an early date is solicited.



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Respectfully Submitted,

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VERSION SHOWING MARKINGS INDICATING CHANGES MADE.

Please add claims 9-10 to read as follows:

9. (New) A method for forming a multi-layer wiring structure, comprising the following steps:

(a) etching to form via-holes or wiring gutters through a resist mask on an insulating film between layers of a silica system having a dielectric constant being equal to or less than 3.5, said insulating film between the layers of the silica system containing carbon from 5% by atomic weight to 25% by atomic weight;

(b) filling up said wiring gutters or said via-holes with conductive material using a damascene method; and

(c) performing an ashing process on said resist mask using oxygen gas plasma under an atmospheric pressure from 0.01 Torr to 30.0 Torr.

10. (New) A method for forming a multi-layer wiring structure, as described in [the] claim 9, wherein said insulating film between layers of silica system is formed by coating and baking a coating liquid including a chemical compound, being obtained through hydrolysis and condensation reaction of at least one kind of alkoxysilane compounds in organic solvent under presence of an acid catalyst, wherein said one kind of alkoxysilane compounds is selected from alkoxysilane compounds expressed by the following general equation (I):



wherein, R in the general equation (I) indicates an alkyl group having carbon number from 1 to 4 or an aryl group, R¹ indicates an alkyl group having carbon number from 1 to 4, and n indicates an integer from 1 to 2.